

# Appendicitis in a Tropical African Population

Oluwole G. Ajao, MB,BS (Lond), FRCS (C), Am Board Cert, FMCS (Nig), FWACS  
Ibadan, Nigeria

Acute appendicitis was once thought to be rare among rural blacks. It is now known that appendicitis is relatively common among Africans and in Africa. At the University College Hospital, Ibadan, Nigeria, appendicitis is the most common cause of acute abdomen on the surgical service.

One hundred and eighty-one cases of appendicitis were operated on in a two-year period from June 1975 to June 1977. A retrospective analysis of 47 fully documented cases showed that wrong diagnosis occurred more often in females than in males. There was a high incidence of perforation (31.9 percent) in this series. Deaths occurred in perforated cases and cases complicated by typhoid perforation of the terminal ileum. Parasites and their ova were often present in the lumen of some appendices.

The age group most affected was 16 to 20 years. This disease affected low, middle and upper income groups in our society. Chronic, recurrent appendicitis was frequently diagnosed (31.9 percent) and history of recurrent right lower quadrant pain as far back as three months was often elicited from these patients.

## Introduction

Acute appendicitis has been claimed to be rare among rural blacks and "in primitive and underprivileged populations in developing countries . . ."<sup>1</sup> At the University College Hospital, Ibadan, Nigeria, appendicitis is now found to be the most common cause of acute abdomen on the surgical service. One hundred and eighty-one cases of appendicitis were operated upon in a two-year period from June 1975 to June 1977. A retrospective study of 47 cases that were fully documented and had all the relevant data, showed a relatively high number of perforations. One rea-

son for this situation is a delay in surgical intervention, which is also probably due to the erroneous notion that appendicitis is rare among blacks.

The purpose of this paper is to present the 47 cases of appendicitis operated upon at the University College Hospital, Ibadan, Nigeria, and also to emphasize the relatively common occurrence of this condition in Africans.

## Clinical Materials

Forty-seven cases of appendicitis operated on at the University College Hospital, Ibadan, Nigeria were studied. This does not include incidental appendectomy performed during laparotomy for other conditions. This series consists of those cases diagnosed as ap-

pendicitis prior to operation, and those that presented as other cases of acute abdomen, but turned out to be cases of appendicitis.

The patients were divided into three socioeconomic groups: the low income group, consisting of indigenous farmers, traders and other less educated people; the middle income group, consisting of students, nurses, teachers and clerks; and the upper income group, consisting of a principal of a school and a physician.

The age, sex of patient, and length of the removed appendices were noted. Histologically, appendicitis is diagnosed when mucosa is ulcerated and when inflammatory cells are present in the submucosa or throughout the wall of the appendix. The presence of fibrosis and/or chronic inflammatory cells in the submucosa gives rise to the diagnosis of chronic, recurrent appendicitis. When the inflammatory cells are limited to the serosa of the appendix and the mucosa is intact, this is diagnosed as periappendicitis and the pathology is believed not to arise from the appendix.

## Results

Of the 47 patients who had appendicitis, 17 (36.2 percent) were females and 30 (63.8 percent) were males. Wrong diagnosis was made in 14 cases (29.8 percent). A wrong diagnosis was made in 47.1 percent of the females and 20 percent of the males. Total cases of perforated appendix numbered 15 (31.9 percent). In women, three cases (17.6 percent) of perforated appendix occurred, whereas in men, the figure was 12 cases (40 percent). The mortality rate in this series was 10.6 percent (five deaths—one female and four males).

Requests for reprints should be addressed to Dr. Oluwole G. Ajao, Department of Surgery, University of Ibadan and University College Hospital, Ibadan, Nigeria.

Table 1. Appendicitis in Ibadan, Nigeria Age Group Distribution (47 Cases)		
Age-Group	No.	%
1-5	0	0
6-10	5	10.6
11-15	4	8.5
16-20	12	25.5
21-25	8	17.0
26-30	6	12.8
31-35	6	12.8
36-40	3	6.4
Over 40	3	6.4
<b>Total</b>	<b>47</b>	<b>100.00</b>

The highest incidence occurred in the middle class socioeconomic group (59.6 percent), followed by low socioeconomic group (36.2 percent), and, lastly, the upper group (4.3 percent). This is parallel also to the order of number of admissions of each group. The highest incidence is seen in the age group 16 to 20 years followed by 21 to 25 years (Table 1).

Fifteen patients (31.9 percent) in this series had chronic, recurrent appendicitis as shown by fibrosis and/or chronic inflammatory cells in the wall of the appendix (Table 2). This shows that these patients have had previous episodes of acute appendicitis that subsided. A history of recurrent right lower quadrant pain for a period as short as three months and in a few cases as long as four years is often elicited from this group. Only 17 patients (36.2 percent) presented with the classical history of periumbilical pain localizing in the right lower quadrant. Some cases presented with a colicky abdominal pain and most of the cases with perforation presented with a classical picture of small bowel obstruction, especially when abscess is localized in the right lower quadrant. Plain roentgenograms of the abdomen showed multiple fluid levels, dilated bowel loops, thickening of bowel wall, and ground glass or mottling appearance in the right lower quadrant. One patient claimed that his pain was due to a blow received on the abdomen during a scuffle at school.

In three cases, ascaris worms were present in the ileum,<sup>2,3</sup> and one patient had numerous calcified schistosoma ova in the submucous layer of the appendix. Postoperatively, she was

Table 2. Appendicitis in Ibadan, Nigeria (47 Cases)			
	Total (%)	Females (%)	Males (%)
Appendicitis	47	17 (36.2)	30 (63.8)
Wrong diagnosis	14 (29.8)	8 (47.1)	6 (20 )
Perforated	15 (31.9)	3 (17.6)	12 (40 )
Appendicitis			
Chronic	15 (31.9)	8 (47 )	7 (23.3)
Appendicitis			
Mortality	5 (10.6)	1 ( 5.9)	4 (13.3)

Table 3. Appendicitis in Ibadan, Nigeria Postoperative Complications (37 Complications)		
Complications	No.	%
Malaria	11	29.7
Wound infection	15	40.5
Sepsis	3	8.1
Fecal fistula	1	2.7
Intra-abdominal abscess	1	2.7
Pulmonary infection	4	10.8
Jaundice	2	5.4
<b>Total</b>	<b>37</b>	<b>99.9</b>

treated with niridazole (ambilhar). Fifteen cases (31.9 percent) in this series were diagnosed as chronic recurrent appendicitis because of the presence of submucous fibrosis and chronic inflammatory cells. The length of the appendices varied from 5 to 10 cm with an average length of 7.57 cm. There was an unusually long one measuring 14 cm, and a rudimentary one measuring 1.5 cm. The most common postoperative complication is wound infection,<sup>4</sup> followed by malarial fever<sup>5</sup> and pulmonary disorders, respectively (Table 3). One patient had a perforated necrotic appendix. Postoperatively, he developed a left subphrenic abscess, right subhepatic abscess, pelvic abscess, pulmonary infection, malarial fever and fecal fistula. He had three additional operations for closure of fecal fistula, drainage of intra-abdominal abscess, and a month later, lysis of small bowel adhesions. Two patients who had postoperative jaundice most probably had portal pyemia.

One patient died five days postoperatively as a result of pulmonary embolism diagnosed at autopsy. Two patients who also had typhoid perforation died. The two other deaths were due to septicemia. Apart from the two cases complicated by typhoid perforation, all the fatalities had perforated appendices.

## Discussion

In this series there is an unusually high number of cases of perforation of appendix (31.9 percent). This may be due to the fact that patients do not seek medical help in time, and because of the delay in surgical intervention. Self-medication is still very common in our area of catchment<sup>6</sup> and it is not unusual for a patient with a pain of "indigestion" to take a harsh laxative.

In one reported series, the pre-operative diagnostic accuracy of ap-

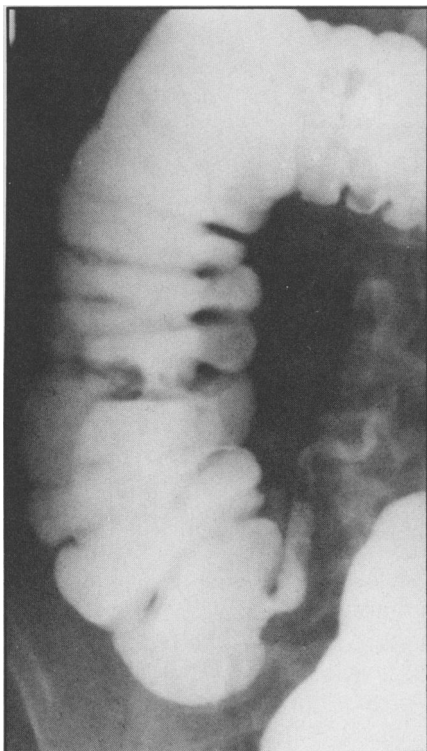


Figure 1. Barium enema visualizing an uninflamed appendix. Cecum is also normal



Figure 2. Patient presented with right lower quadrant pain diagnosed as "chronic appendicitis." Barium enema shows normal visualizing appendix, but a filling defect was noted in the cecum. Patient had carcinoma of the cecum

pendicitis was 79 percent for males and 54 percent for females.<sup>7</sup> Because of the increased morbidity and mortality associated with a perforated appendix, some believe that it is not unjustified to misdiagnose, and therefore remove about 20 to 25 percent of normal appendices in any series on appendicitis.<sup>8,9</sup>

The diagnosis of acute appendicitis is essentially based on clinical examination. Because obstruction of appendiceal lumen is essential for acute appendicitis, visualization of an appendix (Figures 1 and 2) during a barium enema examination is believed to rule out a diseased appendix.<sup>10</sup> Non-filling of an appendix, however, does not confirm a diseased appendix, and partial visualization of an appendix does not exclude segmental disease. Sakover and Del Fava<sup>11</sup> believe that appendices will visualize in a routine barium enema examination unless the cecum or right colon is diseased.

In this series, ascaris worms were found in ileum in three cases and one patient had ova of schistosoma in the appendiceal wall. In a study of the appendices of some cadavers, Solanke<sup>12</sup> and others<sup>13</sup> have also found *Ascaris lumbricoides*, *Trichuris trichuria*, *Enterobius vermicularis*, an ova of parasites in the lumen of some appendices.

The most important differential diagnosis in females is pelvic inflammatory disease. A history of vaginal discharge, pain occurring in both iliac fossae especially just before or during or just after menstruation, and excruciating pain on cervical excitation will confirm the diagnosis of pelvic inflammatory disease. Apart from other gynecological conditions, perforated cecal carcinoma, cecal ameboma, and typhoid perforation are strong differential diagnoses in our environment. Crohn disease is rare in this hospital, and in some tropical African countries.

The treatment of appendicitis is surgical. However, when there is any doubt, systemic antibiotics, nasogastric suction and intravenous infusion may be instituted for a short period. It is believed by some, and this view is shared by this author, that appendiceal mass or abscess should be drained. Incision should be placed over the mass to prevent peritoneal soiling. If the appendix is inaccessible, adequate drainage will suffice, and an appendicectomy may be performed in about 6 to 12 weeks when the acute inflammation should have

subsided. In pediatric age group the view is held that appendix should be removed at the time of drainage of the appendiceal mass. In this age group the appendix is conical and has a wider lumen; cecal fecal fistula may persist if the appendix is not removed.

Postoperative complications in this series included wound infection,<sup>4</sup> malarial fever,<sup>5</sup> pulmonary infection, septicemia, jaundice, intra-abdominal abscess, and fecal fistula.

## Conclusion

Contrary to the previously held belief, appendicitis is not rare in Africans. It is now the most common cause of acute abdomen on the surgical service at the University College Hospital, Ibadan, Nigeria.

There is a relatively high incidence of perforation, most probably due to a delay in surgical intervention. This is directly related to morbidity and mortality of this condition.

To avoid serious complications like portal pyemia, in appendiceal mass or abscess, urgent surgical management is required.

## Acknowledgement

The author wishes to thank Miss Kehinde Afadama for her secretarial assistance.

## Literature Cited

1. Walker ARP, Richardson BD, Walker BF, et al: Appendicitis, fibre intake and bowel behaviour in ethnic groups in South Africa. *Postgrad Med J* 49:243, 1973
2. Ajao OG, Solanke TF: Surgical aspects of intestinal ascariasis. *J Natl Med Assoc* 69:149-151, 1977
3. Ajao OG, Ajao OA: Ascariasis and acute abdomen. *Trop Doctor* 9:33-36, 1979
4. Ajao OG: Surgical wound infection: A comparison between dressed and undressed wounds. *J Trop Med Hyg* 80:192-196, 1977
5. Ajao OG: Malaria and post-operative fever. *J Trop Med Hyg* 81:153-155, 1978
6. Ajao OG, Solanke TF: Benign esophageal stricture in a Tropical African population. *J Natl Med Assoc* 70:497-499, 1978
7. Chang FC, Hogle HH, Welling DR: The fate of the negative appendix. *Am J Surg* 126:749-756, 1955
8. Cantrell JR, Stafford ES: The diminishing mortality from appendicitis. *Ann Surg* 141:749-756, 1955
9. Hobson T, Rosenman LD: Acute appendicitis—when is it right to be wrong. *Am J Surg* 108:306-312, 1964
10. Soler CS: Use of barium in diagnosis of acute appendiceal disease. *Clin Radiol* 19:410-415, 1968
11. Sakover RP, Del Fava RL: Frequency of visualization of the normal appendix with barium enema examination. *Am J Roentgenol Rad Ther Nucl Med* 121:312-317, 1974
12. Solanke TF: The position, length and content of the vermiform appendix in Nigerians. *Brit J Surg* 57:100-102, 1970
13. Boules PB, Cowie AGA: Pinworm infestation of the appendix. *Brit J Surg* 60:975-976, 1973